BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellant:	R. Christopher Carney et al.	
Application No.:	10/718,122 – Conf. No. 9095	Group Art Unit: 3742
Filed:	November 20, 2003	Examiner: Maria Alexandra Elve
Entitled:	METHOD AND APPARATUS FOR LASER DRILLING WORKPIECES	
Docket No.:	102863-23 (ETH5081USNP)	

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APPEAL BRIEF PURSUANT TO 37 C.F.R. §41.37

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I. REAL PARTY IN INTEREST

The real party in interest is Ethicon, Inc., a Johnson & Johnson Company. Ethicon, Inc. of Somerville, New Jersey derives its rights in this application by virtue of an assignment of the application by the inventors to Ethicon, Inc. as recorded at Reel 020246, Frame 0691.

II. RELATED APPEALS AND INTERFERENCES

None.

III. STATUS OF CLAIMS

Claims 1-8 are currently pending in the present application and stand rejected. Accordingly, claims 1-8 are subject to appeal.

IV. STATUS OF AMENDMENTS

No amendments were made subsequent to the non-final Office Action mailed on February 4, 2009.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The pending claims are directed to methods and devices for laser drilling a vibrating workpiece. Independent claim 1 recites a method of laser drilling a vibrating workpiece that includes providing a workpiece engaged by a first vibrating frame of a vibrating machine, wherein the workpiece is vibrating substantially in unison with the first vibrating frame. For example, as shown in FIG. 1, the method can include providing a workpiece (70) engaged by a vibrating machine frame (60) such that the workpiece (70) and the frame (60) vibrate substantially in unison. *See also Specification* at p. 4, ll. 19-26. The method of claim 1 also includes providing a laser apparatus mounted to a second frame, wherein the second frame is substantially isolated from the vibrating frame and does not vibrate. As illustrated for example in FIG. 1, a laser (10) can be mounted to a table (20), separate from the vibrating machine frame (60), such that the laser (10) and table (20) are substantially isolated therefrom and do not vibrate. *See also Specification* at p. 4, l. 27 – p. 5, l. 1. The method of claim 1 also includes providing a spherical focusing lens that is mounted to the first vibrating frame, wherein the

spherical focusing lens is vibrating substantially in unison with the first vibrating frame. As again shown for example in FIG. 1, a spherical lens (50) can be mounted to the same machine frame (60) by which the work piece (70) is engaged, such that the lens (50) vibrates substantially in unison therewith. *See also Specification* at p. 4, ll. 19-31. The method of claim 1 further includes aligning the laser apparatus and the spherical focusing lens such that a laser beam emitted by the laser apparatus is directed through the vibrating spherical focusing lens to a target location on the vibrating workpiece and causing the laser apparatus to emit a beam through the spherical focusing lens, wherein the beam is stationary with respect to the vibrating spherical focusing lens, and wherein the beam strikes the vibrating workpiece at the target location. FIG. 1 illustrates an example of this, depicting a laser beam (15) being emitted from a laser (10), through the vibrating spherical lens (50), and onto a workpiece (70) at a target site (72). *See also Specification* at p. 4, l. 28 – p. 5, l. 10.

The method of claim 1 is also depicted for example in FIG. 4 (reproduced herein), which illustrates a workpiece (400) that is engaged by a vibrating machine frame (370) such that the workpiece (400) vibrates substantially in unison with the machine frame (370). A laser (310) is provided mounted to a second, stationary frame (340) that is substantially isolated from the vibrating machine frame (370) and that does not vibrate. In addition, a spherical lens (350) is provided that is mounted to the vibrating machine frame (370) such that it vibrates substantially in unison therewith. As illustrated, the laser (310) is aligned with the spherical focusing lens (350) such that a laser beam (315) emitted by the laser (310) is directed through the vibrating lens (350) and onto a target location (410) on the vibrating work piece (400). The laser beam (315) is stationary with respect to the vibrating lens (350) and strikes the vibrating workpiece (400) at the target location (410).

FIG. 4A

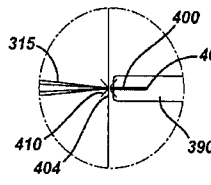

FIG. 4

Independent claim 6 recites an apparatus for laser drilling a vibrating workpiece that includes a workpiece mounted to a first vibrating frame and a laser apparatus mounted to a second frame. *Specification* at p. 4, l. 19 – p. 5, l. 10. The second frame is substantially isolated from the first vibrating frame and is substantially non-vibrating. *Id.* The apparatus further includes a spherical focusing lens mounted to the first vibrating frame for directing a laser beam emitted by the laser apparatus to a target site on the workpiece, such that the spherical focusing lens vibrates substantially in unison with the first vibrating frame, while the laser beam is substantially stationary with respect to the vibrating spherical focusing lens. *Id.* The apparatus of claim 6 is also illustrated for example in FIGS. 1 and 4.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Whether the Examiner improperly rejected claims 1 and 5-6 pursuant to 35 U.S.C. §103(a) as being obvious over Japanese Patent No. JP01-215290 to Kimura et al. ("Kimura") in view of U.S. Patent No. 4,201,905 to Clark et al. ("Clark") and U.S. Patent No. 4,581,939 to Takahashi ("Takahashi").

B. Whether the Examiner improperly rejected claims 1 and 5-6 pursuant to 35 U.S.C. §103(a) as being obvious over German Patent No. DE39-38-779 to Bosch ("Bosch") in view of Clark and further in view of U.S. Patent No. 2,496,051 to Hillier ("Hillier"), and still further in view of Takahashi.

C. Whether the Examiner improperly rejected claims 2-4 and 7-8 pursuant to 35 U.S.C. §103(a) as being obvious over Kimura in view of Clark, and further in view of Takahashi, and still further in view of U.S. Patent No. 6,252,195 to Mosavi ("Mosavi").

D. Whether the Examiner improperly rejected claims 2-4 and 7-8 pursuant to 35 U.S.C. §103(a) as being obvious over Bosch in view of Clark and further in view of Hillier and still further in view of Takahashi and still further in view of Mosavi.

VII. ARGUMENT

A. THE REJECTION OF CLAIMS 1 AND 5-6 PURSUANT TO 35 U.S.C. §103(a) OVER KIMURA, CLARK, AND TAKAHASHI SHOULD BE REVERSED

1. The Examiner's Rejection

Claims 1-8 are rejected pursuant to 35 U.S.C. §103(a) as being obvious over Kimura, Clark, and Takahashi. The Examiner argues that Kimura discloses the inventions of claims 1 and 6, except for isolating the laser from the workpiece and providing a spherical focusing lens. *Office Action dated February 4, 2009* at 2. The Examiner relies on Clark and Takahashi, respectively, to teach these limitations, arguing that it would have been obvious to modify the device of Kimura in view of Clark and Takahashi. Appellants respectfully disagree.

2. Kimura Lacks a Vibrating Frame and No Motivation Exists to Modify It's Frame to Vibrate

Claims 1 and 6 require a workpiece engaged by a first vibrating frame. Kimura is deficient with respect to each of these claims because it altogether lacks a *vibrating* frame. Instead, the sample (3) of Kimura is fixed to a stage (6) that only moves according to precise instructions from a stage controller (7). *See Kimura* at 3-4; *Kimura Figs.* 1, 6. The stage controller (7) causes the stage (6) to move back and forth under a stationary laser beam (2) according to a desired cut pattern. *Id.* An outline detector (17) is provided to determine when the edge of the sample is reached and to instruct the stage controller (7) to reposition the stage (6) and sample (3). *Kimura* at 3-4. Thus, absent specific instruction from the stage controller, the Kimura stage does not move at all, much less vibrate as required by claims 1 and 6. The dictionary defines "vibration" as "a periodic motion of the particles of an elastic body or medium in alternately opposite directions from the position of equilibrium when that equilibrium has been disturbed..." *Webster's Third New International Dictionary* (1993). The movement of the stage in Kimura, which only travels according to discrete and specific directions from a stage controller, certainly does not constitute "vibration." Accordingly, Kimura fails to teach or even suggest an express limitation of the claimed invention.

Although Clark could arguably be construed to teach a vibrating frame, no skilled artisan would modify Kimura to include a vibrating frame since doing so would render Kimura's device inoperable. In order to cut a pattern into a sample, without destroying the delicate living cell, Kimura relies on controlling the speed and movement of the frame with great precision. As explained above, movement is precisely controlled to cut around the edge of a sample. This is done to maintain viability of the living cells in the sample. Any vibration of the frame and/or workpiece would be *fatal* to the Kimura method, as this uncontrolled movement would risk damage to the cell. This is specifically contrary to the teachings of Kimura, as explained in the Problems to Be Solved By the Invention section. In particular, Kimura explains that prior art lasers kill living samples because the lasers only move in the X and Y direction, thus necessarily cutting through the spherical cells. To solve this problem, Kimura designed a system that detects the shape of the living cells and allows the laser to move in the Z direction to avoid cutting through the cells and instead to cut around the cells. Again, any vibration would prevent such precise controlled movement and would destroy the cells. Such a modification is therefore specifically contrary to the teachings of Kimura and would never be made by a person having ordinary skill in the art. This reason alone is sufficient to render claims 1 and 6, as well as claim 5 which depends therefrom, patentable over Kimura.

3. *Each Of the Cited References Lacks a Lens Mounted to the Same Frame as the Sample and No Motivation Exists to Add Such a Lens to Kimura*

Kimura further fails to teach or suggest a lens mounted to the same frame as the sample such that the lens vibrates substantially in unison with the frame, as further required by claims 1 and 6. Instead, the exact opposite is true – Kimura specifically requires that the sample and the lens be mounted to separate frames. This independent movement is illustrated in Figures 1 and 6 of Kimura, which show a sample (3) mounted to a stage (6) and an objective lens (1) and laser beam (2) held stationary above the stage. As explained in Kimura, movement of the stage (6) is controlled by a stage controller (7) and movement of the lens is controlled by a lens-moving controller (15) and lens-moving device (14). Thus, because the lens and sample of Kimura are mounted separately, Kimura lacks a lens mounted to the same frame as the sample, as required by claims 1 and 6.

Clark is similarly deficient because it too lacks a lens that vibrates substantially in unison with the frame by which the workpiece is engaged as claimed. To the contrary, as shown in FIG. 4 of Clark, the cutting head (17) and lens (54) are separated from the work table (71) by a shock-isolating cylinder (47, 48). In fact, Clark expressly states the opposite of what is claimed -- that the cutting head (17) and lens (54) mounted therein are "substantially shock isolated from the punch frame" and that "the springs cooperate with the air cylinder support to shock isolate the cutting head [and the lens]." *Clark* at col. 9, ll. 59-67. Thus, the Clark lens does not vibrate substantially in unison with the frame with which the work piece engages, as claimed, and in fact teaches away from such a configuration.

Furthermore, even if one of these references were to teach mounting the lens to the same frame as the sample, no person skilled in the art would so modify Kimura since doing so would render the device unsatisfactory for its intended purpose and change its principle of operation, in violation of MPEP § 2143.01(V) and (VI). It is a fundamental requirement of Kimura that the lens and sample not be mounted to the same frame, since such a configuration would prevent the sample from moving independently of the lens. As explained above, the whole purpose of Kimura is to move the sample relative to the lens and laser to cut the outline of a cell. If the sample were mounted to the same frame as the lens, as required by claims 1 and 6, the sample could only be cut at one distinct point. There is thus no motivation to modify Kimura to reach the claimed invention.

4. Kimura Fails To Teach Drilling Holes And No Motivation Exists To Modify Kimura To Drill Holes

As conceded by the Examiner, Kimura fails to teach drilling holes. *Final Office Action dated November 14, 2007* at 2. Rather, as the stage (6) of Kimura is moved beneath a stationary laser (2), the laser (2) etches around three-dimensional cells suspended in a sample (3). *See Kimura* at 2-3; *Figures* 2, 6. As explained at page 2 of Kimura, the Kimura device is designed to remove material surrounding a generally spherical cell, such as a fertilized ovum, without damaging or killing the sample. Drilling a hole through the sample would be entirely contrary then to the purpose of Kimura, as it would destroy the delicate cell. Accordingly, there is no way

to modify Kimura to drill a hole while still maintaining its intended capability of cutting around a delicate, three-dimensional cell. A reference directed toward drilling holes does not provide any advantage when trying to carve living cells from a sample as in Kimura. In fact, one seeking to modify Kimura would want to ensure that the laser *doesn't* drill holes in the cell, since the entire purpose of Kimura is to avoid damage to the fragile living sample. Thus, there is no motivation to modify Kimura to drill holes.

5. There is no Motivation to Modify Kimura with the Spherical Lens of Takahashi

The Examiner also concedes that Kimura fails to teach or suggest yet another limitation of claims 1 and 6 – a spherical lens. The Examiner relies on Takahashi to teach a spherical lens, but again, no motivation is provided to combine this reference with Kimura.

It is well settled that "the mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." *In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992). Takahashi does not provide any teachings relating to the spherical lens that would motivate a skilled artisan to use such a lens with Kimura. Instead, Takahashi merely states that a spherical lens is used, without providing any advantages to doing so.

The Examiner further argues that the addition of a spherical lens to Kimura can be accomplished merely by rearranging parts. *Office Action dated February 4, 2009* at 4. This argument fails, however, since the Examiner has already admitted that Kimura lacks components of the claimed invention. In other words, there is no way for the parts of Kimura to be rearranged to reach the claimed invention if several parts are missing. Moreover, even in the case of a rearrangement some motivation is required:

> "The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The *prior art must provide a motivation or reason* for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device." Ex parte Chicago Rawhide Mfg. Co., 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984).

MPEP § 2144.04(VI)(C) (emphasis added). Accordingly, since the Examiner has failed to identify even a shred of motivation to alter Kimura to include the spherical lens of Takahashi, the rejection based on these references is inappropriate.

6. Kimura is Non-Analogous Art

Lastly, it is inappropriate to rely on Kimura at all, as it is non-analogous art. To be analogous, a reference must either be within the field of the inventor's endeavor or be reasonably pertinent to the particular problem with which the inventor was involved. *In re Deminski*, 796 F.2d 436, 442 (Fed. Cir. 1986).

First, the Kimura method for shaping a three-dimensional living cell is clearly outside the field of drilling holes in a vibrating workpiece. The fact that Kimura and the present invention use lasers for cutting, as suggested by the Examiner, does not render Kimura analogous. The Examiner's reliance on such a broad interpretation of the field of Appellant's endeavor is improper. Second, Kimura is not reasonably pertinent to the particular problem with which Appellants were involved. The problem being solved is not simply a biological problem, as suggested by the Examiner, rather the purpose of the claimed method is drilling precise holes in a vibrating workpiece without subjecting the drilling laser to vibration. *Specification* at 2. The purpose of Kimura on the other hand is to cut around three-dimensional living cells without destroying them. *Kimura* at 2. This is a vastly different problem than drilling precise holes in a workpiece. A reference is reasonably pertinent if it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem. *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992). Because Kimura is directed to a entirely different purpose than the claimed invention, no inventor would be motivated to consider Kimura because it is simply not relevant to solving the purpose of the claimed invention. *See id.* Accordingly, Kimura is non-analogous art and reliance thereon is inappropriate.

In sum, Kimura is deficient with respect to at least four limitations of claims 1 and 6, none of which is adequately addressed by the secondary references cited by the Examiner. Moreover, Kimura is non-analogous art, and as such cannot be relied upon to reject the claimed invention as obvious. Accordingly, claims 1 and 6 are not obvious over Kimura, Clark, or Takahashi, taken alone or in combination. Claim 5 is not obvious at least because it depends from claim 1.

B. THE REJECTION OF CLAIMS 1 AND 5-6 PURSUANT TO 35 U.S.C. §103(a) OVER BOSCH, CLARK, HILLIER, AND TAKAHASHI SHOULD BE REVERSED

1. The Examiner's Rejection

Claims 1 and 5-6 stand rejected pursuant to 35 U.S.C. §103(a) as being obvious over Bosch, Clark, Hillier, and Takahashi. The Examiner argues that Bosch teaches drilling holes in a vibrating workpiece, that Clark teaches isolating the laser from the workpiece, that Hillier teaches providing a work piece and a lens that vibrate substantially in unison with a first vibrating frame, and that Takahashi teaches a spherical lens. *Office Action dated February 4, 2009* at 3-4. The Examiner argues that it would have been obvious to modify Bosch with the teachings of Clark, Hillier, and Takahashi to arrive at the claimed invention. *Id.* Appellants respectfully disagree.

2. The Scope and Content of the Prior Art

Bosch discloses a laser fuel injector drill. As shown in Figure 1 of Bosch, a plurality of laser beams (6) are focused through a lens (8) onto a workpiece (1), forming a bore (2) therein. The workpiece is positioned on a holder (3) that is rotated about the central axis of the bore (2) by a motor (22). *Bosch* at FIG. 1. The holder (3) also oscillates up and down in the direction of the illustrated arrow (18) at an ultrasonic frequency. *Id.*

Hillier teaches an electron microscope where the specimen cartridge fits into a recess formed in the objective lens. *Hillier* at FIG. 1. In Hillier, an electron beam (27) is directed first through a specimen (25) and then through an objective lens (4). *Id.* The beam then travels through a central aperture (12) in an exit pole (10), at which point it can be viewed as a magnified image of the specimen (25). *Id.* When external vibration is applied, the lens (4) and the specimen (25) of Hillier vibrate substantially in unison because the specimen (25) in Hillier is situated within and supported only by a recess in the objective lens (4). *Hillier* at FIG. 1; col. 4, ll. 41-49.

3. No Motivation Exists to Combine the Unitary Lens/Stage of Hillier with Bosch

"The key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious." *MPEP* § 2141(III). The Supreme Court in *KSR Int'l Corp. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741 (2007), quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006), stated that "rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." Here, the only reasoning the Examiner has provided for combining the lens/stage arrangement of Hillier with the fuel injector drill of Bosch is to "minimize machining errors due to drift." This argument fails, however, because Bosch is already effective to eliminate drift-related machining errors. In fact, this is the exact reason why the Bosch workpiece is rotated and ultrasonically oscillated up and down during the drilling operation – to achieve a uniform bore hole in the workpiece. *See Bosch* at col. 1; ll. 6-57. Moreover, modifying the Bosch drill to have a unitary lens/workpiece holder as taught by Hillier would counteract this feature. If the lens and workpiece of Bosch were to move in unison as taught by Hillier, the rotation and oscillation of the workpiece would be negated by the identical rotation and oscillation of the lens, resulting in a bore hole that is no more uniform than had the lens and workpiece both been stationary.

In sum, Bosch is already effective in reducing machining errors due to drift because it already includes a mechanism for rotating and oscillating the workpiece with respect to the laser beam. Moreover, even if Bosch could benefit from the Examiner's proposed combination, the combination would actually increase machining errors and distortion of the bore hole. Accordingly, no skilled artisan would have been motivated to combine the teachings of Bosch and Hillier to reach the inventions of claims 1 and 6.

4. The Examiner's Proposed Combination is Impossible

Furthermore, it would have been impossible to incorporate the unitary lens/sample holder (4, 25) of Hillier with the apparatus of Bosch because in Hillier, the beam passes through the sample *before* passing through the lens. Such a configuration would render the Bosch apparatus useless, as the multiple laser beams (6) would not be focused to a single point until *after* passing through the workpiece (it is not until the Bosch beams (6) pass through the lens (8) that they are

focused to a single point). Put differently, the only way to modify Bosch to include the Hillier teaching of the sample and the lens vibrating in unison would be to put the workpiece (1) of Bosch between the laser (5) and the top of the lens (8). If this is done, however, the laser beams (6) of Bosch will hit the workpiece (1) before being focused on the target drilling site by the lens (8), thereby producing multiple holes in the workpiece. This result is unacceptable in Bosch, where a single, perfectly uniform hole is desired. Accordingly, it is not possible to combine the teachings of Bosch and Hillier as suggested by the Examiner to reach the inventions of claims 1 and 6.

5. No Motivation Exists to Combine the Spherical Lens of Takahashi with Bosch

The Examiner relies on Takahashi to teach a spherical lens, but no motivation is provided to combine this reference with Bosch and/or Hillier other than that to do so would be an obvious rearrangement of parts.

As explained above, "the mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." *In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992). Takahashi does not provide any teachings relating to the spherical lens that would motivate a skilled artisan to use such a lens with Bosch or any other reference. Instead, Takahashi merely states that a spherical lens is used, without providing any advantages to doing so. Moreover, even in the case of a rearrangement some motivation is required:

> "The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The *prior art must provide a motivation or reason* for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device." Ex parte Chicago Rawhide Mfg. Co., 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984).

MPEP § 2144.04(VI)(C) (emphasis added). Accordingly, since the Examiner has failed to identify even a shred of motivation to alter Bosch to include the spherical lens of Takahashi, the rejection based on these references is inappropriate.

6. Clark

Clark is relied upon merely to teach mounting the laser to a frame that is isolated from the workpiece and does nothing to remedy the deficiencies discussed above in Bosch, Hillier,

and Takahashi.

Consequently, independent claims 1 and 6 are not obvious over Bosch, Clark, Hillier, or Takahashi, taken alone or in combination. Claims 1 and 6 therefore represent allowable subject matter and claim 5 is likewise allowable at least because it depends from an allowable base claim.

C. THE REJECTION OF CLAIMS 2-4 AND 7-8 PURSUANT TO 35 U.S.C. §103(a) OVER KIMURA, CLARK, TAKAHASHI, AND MOSAVI AND OVER BOSCH, CLARK, HILLIER, TAKAHASHI, AND MOSAVI SHOULD BE REVERSED

Claims 2-4 and 7-8 are rejected pursuant to 35 U.S.C. §103(a) as being obvious over Kimura, Clark, Takahashi, and U.S. Patent No. 6,252,195 to Mosavi ("Mosavi"). Claims 2-4 and 7-8 are also rejected as being obvious over Bosch, Clark, Hillier, Takahashi, and Mosavi. Mosavi is merely relied upon to teach discrete features recited in the dependent claims, and does not remedy the deficiencies of Kimura and Bosch discussed above with respect to the independent claims. Claims 2-4 and 7-8 are therefore non-obvious and allowable at least because they depend from allowable base claims.

VIII. CONCLUSION

For the reasons noted above, Appellants submit that the pending claims define patentable subject matter. Accordingly, Appellants request that the Examiner's rejection of these claims be reversed and that the pending application be passed to issue.

Respectfully submitted,

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APPENDIX A: CLAIMS ON APPEAL

1. (Previously Presented) A method of laser drilling a vibrating workpiece, comprising:

providing a workpiece engaged by a first vibrating frame of a vibrating machine, wherein the workpiece is vibrating substantially in unison with the first vibrating frame;

providing a laser apparatus mounted to a second frame, wherein the second frame is substantially isolated from the vibrating frame and does not vibrate;

providing a spherical focusing lens that is mounted to the first vibrating frame, wherein the spherical focusing lens is vibrating substantially in unison with the first vibrating frame;

aligning the laser apparatus and the spherical focusing lens such that a laser beam emitted by the laser apparatus is directed through the vibrating spherical focusing lens to a target location on the vibrating workpiece; and

causing the laser apparatus to emit a beam through the spherical focusing lens, wherein the beam is stationary with respect to the vibrating spherical focusing lens, and wherein the beam strikes the vibrating workpiece at the target location.

2. (Original) The method of claim 1, wherein the laser comprises an Nd-Yag laser.

3. (Original) The method of claim 1, wherein the workpiece comprises a surgical needle.

4. (Original) The method of claim 1, wherein the laser beam is pulsed.

5. (Previously Presented) The method of claim 1, wherein the workpiece is mounted to a fixture which is mounted to the first vibrating frame, wherein the fixture vibrates substantially in unison with the first vibrating frame.

6. (Previously Presented) An apparatus for laser drilling a vibrating workpiece, comprising:

a workpiece mounted to a first vibrating frame;

a laser apparatus mounted to a second frame, wherein the second frame is substantially isolated from the first vibrating frame and is substantially non-vibrating; and,

a spherical focusing lens mounted to the first vibrating frame for directing a laser beam emitted by the laser apparatus to a target site on the workpiece, such that the spherical focusing lens vibrates substantially in unison with the first vibrating frame, while the laser beam is substantially stationary with respect to the vibrating spherical focusing lens.

7. (Original) The apparatus of claim 6, wherein the laser comprises an Nd-Yag laser.

8. (Original) The apparatus of claim 6 wherein the workpiece comprises a surgical needle.

APPENDIX B: EVIDENCE

None.

APPENDIX C: RELATED PROCEEDINGS

None.

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